

1 REMARKS

2 Status of Claims

3 Claims 1-44 remain pending in the present application, Claims 1, 3, 10-11, 21-30, 34, 38, and  
4 41 having been amended to more clearly distinguish the recited subject matter over the cited art, and  
5 Claims 4, 16, 19, 23, and 35 having been amended to clarify the recitation and correct minor errors.

6 Brief Summary of Telephone Interview

7 On March 13, 2007, applicants' attorney discussed the current Office Action with Examiner Solanki  
8 and her supervisor, Mr. Brian Casler, during a telephone interview. Applicants' attorney appreciates  
9 Examiner Solanki's willingness to explain her position with respect to the claim objections, the 35 U.S.C.  
10 § 101 rejection, and her reasons for concluding that applicants' proposed amendments fail to distinguish  
11 over U.S. Patent No. 6,498,946 (Foo et al., hereinafter referred to as "Foo").

12 With respect to the claim objections, Examiner Solanki indicated that she will withdraw her  
13 objections to Claims 9 and 20 in their current form. With respect to her potential objection to  
14 Claims 12 and 31 (if Claims 11 and 30 were found allowable), the Examiner explained that she believes  
15 Claims 12 and 31 are substantial duplicates of Claims 11 and 30, respectively, because she perceives  
16 "substantially zero" to be equivalent to "approaching zero."

17 With respect to the 35 U.S.C. § 101 rejections regarding a useful, concrete, or tangible result,  
18 Examiner Solanki indicated that applicants' amendments to the independent claims were sufficient to  
19 overcome these rejections. However, she noted that with respect to the pulse sequence of independent  
20 Claim 21, the proposed amendments would not overcome her rejection, because she perceives that the  
21 recitation in the preamble of "a pulse sequence" reads on natural phenomena. She explained that it  
22 would be necessary to change this portion of the preamble to recite, for example, "a method" and  
23 cautioned to beware of duplicate claims if applicants' attorney decided to change independent Claim 21  
24 to a method claim. She also indicated that applicants' attorney may wish to review the article that she  
25 referenced under her rejection, because it provides guidance on this subject.

26 With respect to the 35 U.S.C. § 102 rejections, applicants' attorney explained how they had  
27 amended step (b) of independent Claim 1 in order to more clearly describe their novel approach as  
28 illustrated in FIGURE 1. Applicants' attorney asked Examiner Solanki if, in view of the amendment to  
29 step (b), the claim now distinguishes over Foo, and particularly drew her attention to Foo's FIGURE 2 as  
30 compared to applicants' FIGURE 1. Examiner Solanki explained that she did not perceive this

1 amendment as distinguishing and pointed to Foo's Abstract, which teaches acquiring data for each  
2 spatial slice, and to column 2, lines 13-16 of Foo, which teach multi-slice coverage in a single  
3 acquisition. Applicants' attorney indicated that she would review this proposed claim amendment in  
4 order to try to clarify why the proposed amendment patentably distinguishes over Foo.

5 Applicants' attorney also asked Examiner Solanki if she believes that Foo teaches applicants'  
6 step (d), which recites "waiting a predefined delay time." The Examiner explained that she had not had  
7 time to review the Foo patent prior to the interview with respect to this point, but that applicants'  
8 attorney was welcome to bring up this point in the written Office Action response.

9 Applicants' attorney would like to again thank Examiner Solanki and Mr. Casler for their time and  
10 willingness to discuss these issues during the telephone interview.

#### 11 Improper Information Disclosure Statement

12 The Examiner has indicated that the listing of references of Song et al. and Parker et al. in the  
13 specification is not viewed as equivalent to citing these references in an Information Disclosure  
14 Statement. A Supplementary Information Disclosure Statement including these references is hereby  
15 submitted with this response.

#### 16 Claim Objections

17 The Examiner has objected to Claim 16 because it contains a typographical error. Applicants  
18 have amended Claim 16 to correct the typographical error and respectfully request the Examiner  
19 withdraw her objection to this claim.

20 The Examiner has objected to Claims 9 and 20 for reciting claims upon which they do not  
21 depend. However, during the interview, the Examiner withdrew this objection.

22 The Examiner has further advised that should Claims 11 and 30 be found patentable,  
23 Claims 12 and 31 will be objected to as being a substantial duplicate thereof. Applicants respectfully  
24 disagree with this potential objection because applicants perceive that the use of the term  
25 "substantially zero" in Claims 11 and 30 and the use of the term "approaching zero" in Claims 12  
26 and 31 define different concepts regarding the magnetization of flowing blood. For example, a value  
27 that is substantially zero (i.e., approximately zero) defines a magnetization of blood that may be fixed  
28 at a value approximately equal to zero, while a magnetization of blood that is approaching zero  
29 indicates that the value of this parameter is changing and is becoming increasingly closer to zero.  
30 These two mathematical conditions are thus quite different.

1 Claims Rejected under 35 U.S.C. § 101

2 The Examiner has rejected Claims 1-13, 19, and 20 under 35 U.S.C. §101 because the  
3 Examiner asserts that the claimed invention is directed to non-statutory subject matter. In addition,  
4 the Examiner has indicated that dependent Claims 2-9 and 11-13, 19 and 20 are also rejected.  
5 Accordingly, applicants have amended independent Claim 1, step (e) and independent Claim 10,  
6 steps (c) and (e) to recite the useful, concrete, and tangible result of displaying an image, thereby  
7 enabling visual evaluation of anatomic structures and pathologic tissues of interest.

8 The Examiner has also rejected Claims 21-28 under 35 U.S.C. § 101, because the Examiner  
9 asserts that the claimed invention is directed to non-statutory subject matter since it recites an  
10 electromagnetic pulse sequence, which constitutes a non-statutory natural phenomenon. Applicants  
11 have amended the preamble of Claim 21 to make clear that the pulse sequence is "generated by a  
12 controller" with characteristics that achieve a specific purpose and is thus not a natural phenomenon.  
13 In addition, for the reasons noted below in connection with applicants' discussion of the rejection of  
14 Claim 1, Claim 21 also patentably distinguishes over Foo and the other references cited.

15 Applicants respectfully request that the Examiner withdraw her rejection of Claim 1, 10,  
16 and 21 and her rejection of their respective dependent claims, Claims 2-9 and 11-13, 19 and 20 and  
17 Claims 22-28.

18 Claims Rejected under 35 U.S.C. § 102

19 The Examiner has rejected Claims 1-4, 7, 9-12, 14, 15, 18-20, and 29-33 under  
20 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,498,946 (Foo). The Examiner asserts  
21 that Foo discloses a method and system for multi-slice image acquisition with black-blood contrast,  
22 including steps for applying a non-selective inversion pulse, a slice-selective re-inversion pulse, and  
23 timing execution of a series of RF excitation pulses with fast spin echo (FSE) readout. The Examiner  
24 also asserts that Foo provides means and components for acquiring and storing image data for each  
25 slice in a selected region to be imaged. Finally, the Examiner asserts that the system of Foo includes  
26 an MRI apparatus adapted for imaging a patient, a computer, a display, a memory, and a processor,  
27 all of which combine to perform the black-blood imaging method. Applicants respectfully disagree  
28 with this rejection for at least the following reasons.

29 In the interest of reducing the complexity of the issues for the Examiner to consider in this  
30 response, the following discussion focuses on independent Claims 1, 10, 29, 34, and 41. The

1 patentability of each remaining dependent claim is not necessarily separately addressed in detail.  
2 However, applicants' decision not to discuss the differences between the cited art and each dependent  
3 claim should not be considered as an admission that applicants concur with the Examiner's  
4 conclusion that these dependent claims are not patentable over the disclosure in the cited references.  
5 Similarly, applicants' decision not to discuss the differences between the prior art and every claim  
6 element, or every comment made by the Examiner, should not be considered as an admission that  
7 applicants concur with the Examiner's interpretation and assertions regarding those claims. Indeed,  
8 applicants believe that all of the dependent claims patentably distinguish over the references cited.  
9 However, a specific traverse of the rejection of each dependent claim is not required, since dependent  
10 claims are patentable for at least the same reasons as the independent claims from which the  
11 dependent claims ultimately depend.

#### 12 Patentability of Claim 1

13 Significant differences exist between independent Claim 1 and Foo because the cited art does  
14 NOT teach or suggest within a predefined repetition time, repeatedly imaging *each successive*  
15 *selected single slice* from the plurality of slices at a time when magnetization of the flowing blood is  
16 substantially **zero (step (b))**, or the calculation of a predefined inversion time as a function of a  
17 number of slices to be imaged (step (b)), or waiting a predefined delay time as recited in step (d).  
18 These differences are discussed in further detail below.

19 *(1) Foo does not teach or suggest repeatedly imaging each successive selected single slice within a*  
20 *predefined repetition time when magnetization of the flowing blood is substantially zero*

21 Applicants' step (b) as amended recites:

22 next, waiting a predefined inversion time calculated as a function of a number of slices  
23 to be imaged at the site within the predefined repetition time, wherein the predefined  
24 inversion time is determined so that each application of a sequence of RF pulses and  
25 magnetic field gradient pulses to read out a signal for imaging each successive  
26 selected single slice from the plurality of slices occurs at a time when magnetization of  
27 the flowing blood is substantially zero, wherein the signal for imaging each successive  
28 selected slice is acquired while the magnetization of the flowing blood is substantially  
29 zero for said slice;

30 Applicants' FIGURE 1 is a schematic functional diagram illustrating the timing of applicants'  
slice acquisition scheme for a multi-slice DIR-FSE sequence. In this example, within a given  
repetition time, the DIR sequence is repeated for each slice (e.g. SLICE 1, SLICE 2) while a

shortened inversion time provides imaging of each of several successive slices (see applicants' specification, page 6, lines 25-26). A predefined post-acquisition delay (PAD) is used after an echo pulse train for acquiring the signal to image a slice and has a duration selected to ensure that there are equal time intervals between non-selective inversion pulses (see applicants' specification, page 6, lines 26-29). When both of these conditions are met, the magnetization of flowing blood substantially for each slice of the plurality of successive slices that are being imaged equals zero or approaches zero (see applicants' specification, page 6, lines 29-30).

In contrast, Foo does not teach or suggest *repeatedly* imaging each successive selected slice in the plurality of slices such that the image of the selected slice will be taken when magnetization of the flowing blood is substantially **zero**, and does not teach or suggest doing so *within a predefined repetition time*. The Examiner specifically asserts that Foo discloses steps that are identical to applicants' claimed steps, and include applying a non-selective inversion pulse, a slice-selective reinversion pulse, and timing a series of RF excitation pulses, referring to column 2, lines 4-12 and column 4, lines 36-43, which are reproduced below:

In accordance with one aspect of the invention, a method of multi-slice fast spin echo image acquisition with black blood contrast is disclosed that includes a non-selective inversion pulse and applying a re-inversion pulse that is slice selective over a region encompassing a plurality of slice selections. The method includes timing execution of the series of RF excitation pulses with fast spin echo readout such that signal from black blood is near a null point. Data is then acquired for each spatial slice. (Foo, column 2, lines 4-12.)

Referring to FIG. 2, a pair of ECG gated pulse sequences 10, 20 are shown on a common time axis t. Referring first to pulse sequence 10, after an ECG trigger 12 of an R-R interval, a preparation sequence 14 is applied. Preparation sequence 14 includes a non-selective inversion pulse 14a followed by a slice-selective re-inversion pulse 14b that is slice-selective only for the imaged slice. After an inversion time TI, RF excitation pulses 16 are applied to acquire data for a single spatial location. (Foo, column 4, lines 36-43.)

The Examiner notes that Foo discloses that imaging may be performed over several patient breath-holds in order to successively acquire individual slice images as disclosed in column 1, lines 36-39 that are reproduced below:

Current techniques for the acquisition of multi-slice fast spin echo (FSE) images require that each slice be imaged in separate breath-holds in order to attain black blood contrast in a gated sequence. (Foo, column 1, lines 36-39.)

1  
2 In addition, the Examiner notes that Foo discloses that the image data is acquired during mid-  
3 diastole, which constitutes synchronization with a selected phase of the cardiac cycle as claimed in  
4 the instant application (column 5, lines 11-15) which is reproduced below:

5 It is noted that the sequence 20 can acquire data across either one R--R interval, or  
6 multiple R--R intervals, but the salient point being that data is acquired during mid-  
7 diastole. The exemplary pulse sequence 20 of FIG. 2 shows multi-slice acquisition for  
8 three slices. (Foo, column 5, lines 10-15.)

9 With respect to the Examiner's first citation, Foo discloses that data are being acquired for a  
10 plurality of slices and that the signal is near a null point. In contrast, applicants' claims recite that  
11 signals for imaging of each successive selected slice are acquired when the magnetization of the  
12 flowing blood is substantially zero (for each of those successive selected slices). The Examiner  
13 apparently does not understand an important difference between the approach disclosed by Foo and  
14 that recited in applicants' claims. Foo discloses selecting an inversion time so that blood in the *slab*  
15 is at the null point (Foo, column 2, lines 54-55). But there is no teaching in Foo that the signal for  
16 imaging each slice is acquired when the magnetization of flowing blood is substantially zero, or that  
17 the signal for imaging each specific successive selected slice is repeatedly acquired when the  
18 magnetization of blood flow is substantially equal to zero during the repetition time. Notice that  
19 applicants are reciting that the signal for imaging a successive selected slice is being acquired for  
20 each successive selected single slice of the plurality of slices within the predefined repetition time  
21 (see applicants' FIGURE 1), NOT during multiple repetition times, as taught by Foo. This technique  
22 recited by applicants' claims is accomplished using the predefined inversion time and predefined  
23 delay time (see Claim 1, steps (b) and (d)) and within the predefined repetition time (as recited in step  
24 (e) of Claim 1).

25 With respect to the Examiner's second citation, Foo teaches acquiring data for a single spatial  
26 location, but again there is no teaching that this process is being repeated more than once per  
27 repetition time. Also, while Foo may teach that a zero magnetization for flowing blood occurs when  
28 the signal for imaging a single slice (call it slice X) is being acquired, the signals that are acquired for  
29 imaging the slices that both precede slice X and follow slice X are not acquired when the  
30 magnetization of flowing blood is substantially equal to zero. Indeed, as the signals for imaging

1 slices that are further from slice X are acquired by Foo's approach, the magnetization of flowing  
2 blood becomes increasingly greater and increasingly deviates from zero.

3 Similarly, with respect to the Examiner's third citation, Foo teaches that images for each slice  
4 should be imaged in separate breath-holds – but applicants' approach is independent of the cardiac or  
5 respiratory cycles. The Examiner's fourth citation indicates that the sequence can acquire data across  
6 either one R-R interval or multiple R-R intervals. But neither of these citations teaches acquiring  
7 data for each selected slice without regard to the R-R interval, but only at a time when the signal can  
8 for imaging the current slice can be acquired while the blood magnetization is substantially zero for  
9 each slice. In other words, Foo does not teach imaging each successive selected single slice data  
10 within the predefined repetition time as applicants recite, or when the blood magnetization is  
11 substantially zero for each slice.

12 (2) *Foo does not teach or suggest calculation of a predefined inversion time as a function of a*  
13 *number of slices to be imaged*

14 In addition, applicants recite that their predefined inversion time is calculated as a function of  
15 a number of slices to be imaged at the site so that imaging for each successive selected single slice  
16 can occur when magnetization of the flowing blood is substantially zero. An example of this  
17 calculation is shown in applicants' Equation (1). In contrast, Foo does not teach or suggest the  
18 calculation of a predefined inversion time as a function of the number of slices to be imaged. Foo  
19 teaches that the inversion time is selected to allow a signal from blood to approach a null point only  
20 at a mid-point in the slices to be imaged (see column 6, lines 52-55). But calculation of an inversion  
21 time based on a mid-point in the slices is not equivalent to applicants' predefined inversion time that  
22 is calculated as a function of a number of slices to be imaged such that imaging of each successive  
23 selected single slice can occur for each slice when the magnetization of the flowing blood is  
24 substantially zero.

25 (3) *Foo does not teach or suggest waiting a predefined delay time*

26 Furthermore, applicants recite that a predefined delay time is calculated as a function of the  
27 number of slices to be imaged in step (d). An example of this predefined delay time is shown in  
28 FIGURE 1 as a post-acquisition delay (PAD). In contrast, Foo does not teach or suggest an  
29 equivalent of applicants' predefined delay time.

For the reasons noted above, the rejection of Claim 1 over Foo should be withdrawn, since the claim is patentable over this reference because Foo does not teach or suggest within a predefined repetition time, repeatedly imaging *each successive selected single slice* from the plurality of slices at a time when magnetization of the flowing blood is substantially **zero** (step (b)), or the calculation of a predefined inversion time as a function of a number of slices to be imaged (step (b)), or waiting a predefined delay time, as recited in step (d).

Since dependent claims inherently include what is recited in the independent claim on which they depend, Claims 2-4, 7, and 9 are patentable over Foo for at least the same reasons as set forth above in connection with Claim 1.

#### Patentability of Claim 10

Independent Claim 10 is directed toward a method for multi-slice double inversion-recovery black-blood imaging for a patient. The Examiner has rejected this claim for reasons similar to her rejection of Claim 1. However, applicants respectfully disagree because significant differences exist between independent Claim 10 and Foo because the cited art does NOT teach or suggest within a predefined repetition time, repeatedly imaging *each successive selected single slice* from the plurality of slices at a time when magnetization of the flowing blood is substantially **zero** (step (b)), or the calculation of a predefined inversion time as a function of a number of slices to be imaged (step (b)), or waiting a predefined post-signal acquisition delay time, as recited in step (d).

For the reasons noted above, the rejection of Claim 10 over Foo should be withdrawn, since the claim is patentable over this reference. Similarly, since dependent claims inherently include what is recited in the independent claim on which they depend, Claims 11-12, 14, 15, and 18-20 are patentable over Foo for the same reasons as set forth above in connection with Claim 10.

#### Patentability of Claim 29

Independent Claim 29 is directed towards a system for multi-slice double inversion-recovery black-blood imaging. The Examiner has rejected this claim for reasons similar to her rejection of Claim 1. However, applicants have clarified in subparagraph b(ii)(2) that the predefined inversion time is calculated as a function of a number of slices to be imaged at the site during the predefined repetition time, determined so that magnetization of flowing blood is substantially zero at a time when the signal is acquired for use in producing an image of each successive slice.



1 For the reasons noted above in connection with applicants' traversal of the rejection of  
2 Claim 1, the rejection of Claim 29 over Foo should be withdrawn, since the claim is patentable over  
3 this reference. Similarly, since dependent claims inherently include what is recited in the  
4 independent claim on which they depend, Claims 30-33 are patentable over Foo for at least the same  
5 reasons as set forth above in connection with traversing the rejection of Claim 29.

6 Claims Rejected under 35 U.S.C. § 103(a)

7 The Examiner has rejected Claims 5-6, and 16-17 under 35 U.S.C. §103(a) as being  
8 unpatentable over Foo. The Examiner asserts that Foo is silent with respect to the type of inversion  
9 pulses used for the black-blood imaging method, but states that it is known in the art that adiabatic  
10 inversion pulses can be rendered insensitive to RF field inhomogeneities, and concludes that it would  
11 have been obvious to perform the method of Foo with adiabatic selective and non-selective inversion  
12 pulses in order to reduce the effects of RF field inhomogeneities on the acquired images. The  
13 Examiner also remarks that Foo fails to specify that the non-selective inversion pulse is a rectangular  
14 pulse and since applicants do not provide any patentable advantage in using a rectangular non-  
15 selective inversion pulse during black-blood imaging, and that since it is well known in the art to use  
16 a rectangular pulse as the non-selective inversion pulse during double inversion MR imaging, it  
17 would have been obvious as a matter of design choice to use a rectangular non-selective inversion  
18 pulse while performing the method of Foo.

19 The Examiner has rejected Claims 8, 13, and 33-40 under 35 U.S.C. § 103(a) as being  
20 unpatentable over Foo in view of Fayad et al. ("Noninvasive In Vivo Human Coronary Artery Lumen  
21 and Wall Imaging Using Black-blood Magnetic Resonance Imaging," Circulation 200: pp.506-  
22 510.2000, hereinafter referred to as "Fayad"). With respect to Claims 8 and 13, the Examiner asserts  
23 that although Foo fails to teach that the imaged slices include at least one artery, Fayad teaches that  
24 black-blood MRI may be used to image the coronary artery and lumen wall and concludes that it  
25 would have been obvious to apply the method of Foo to include at least one artery in the imaged  
26 slices for detecting the presence of atherosclerotic plaque in view of the teachings of Fayad. With  
27 respect to Claims 33-40, the Examiner indicates that although Foo fails to provide specific steps of  
28 identifying a plurality of slices which are transverse to the longitudinal direction of the blood vessel  
29 being imaged and steps for imaging atherosclerotic plaque, Fayad teaches a method of MR  
30 black-blood imaging for assessing the morphology of coronary atherosclerosis and further teaches

1 that the method may be performed with proton-density or T2 contrast weighting in order to  
2 characterize the components of detected coronary plaque. The Examiner concludes that it would  
3 have been obvious to modify Foo to further include the weighting scheme of Fayad in order to detect  
4 and classify atherosclerotic plaque in one or more coronary blood vessels of a patient.

5 The Examiner has rejected Claims 41-44 under 35 U.S.C. §103(a) as being unpatentable over  
6 Foo in view of Fayad, and further in view of Kholmovski et al. ("A Generalized k-Sampling Scheme  
7 for 3D Fast Spin Echo," Journal of Magnetic Resonance Imaging, 11: pp.549-555, 2000, hereinafter  
8 referred to as "Kholmovski"). The Examiner asserts that although Foo and Fayad do not teach the  
9 use of multiplanar reformation or minimal intensity projection algorithms for producing the  
10 black-blood image from the acquired image data, it would have been obvious to modify the combined  
11 method of Foo and Fayad to include the step of performing multiplanar reformation or minimal  
12 intensity projection algorithms on the acquired data, in order to more accurately detect and classify  
13 atherosclerotic plaque in the generated black-blood images in view of the teachings of Kholmovski.  
14 The Examiner notes that Kholmovski teaches that multiplanar image reformation and minimum  
15 intensity projection algorithms may be used to create 2D reprojections of fluid circulation in an  
16 anatomical section in order to improve the diagnostic quality of the acquired images. Applicants  
17 respectfully disagree with the above rejections for at least the reasons noted below.

18 In the interest of reducing the complexity of the issues for the Examiner to consider in this  
19 response, the following discussion focuses on independent Claims 34 and 41. The patentability of  
20 each remaining dependent claim is not necessarily separately addressed in detail. However,  
21 applicants' decision not to discuss the differences between the cited art and each dependent claim  
22 should not be considered as an admission that applicants concur with the Examiner's conclusion that  
23 these dependent claims are not patentable over the disclosure in the cited references. Similarly,  
24 applicants' decision not to discuss differences between the prior art and every claim element, or every  
25 comment made by the Examiner, should not be considered as an admission that applicants concur  
26 with the Examiner's interpretation and assertions regarding those claims. Indeed, applicants believe  
27 that all of the dependent claims patentably distinguish over the references cited. However, a specific  
28 traverse of the rejection of each dependent claim is not required, since dependent claims are  
29 patentable for at least the same reasons as the independent claims from which the dependent claims  
30 ultimately depend.

1 Patentability of Claim 34

2 Independent Claim 34 is directed towards a method for enabling visual evaluation of  
3 atherosclerotic plaque in a blood vessel of a patient. The Examiner has rejected this claim over Foo  
4 in view of Fayad. As amended step (c) recites “next, waiting a predefined inversion time calculated  
5 as a function of a number of slices to be imaged at the site within a predefined repetition time, said  
6 predefined inversion time being determined so that the sequence of RF pulses and magnetic field  
7 gradient pulses are applied to read out the signal for imaging each selected single slice at each  
8 successive time when a magnetization signal for the flowing blood is substantially zero, wherein the  
9 signal for imaging each successive selected slice is acquired while the magnetization of the flowing  
10 blood is substantially zero for said slice.”

11 For the reasons noted above in connection with applicants’ traversal of the rejection of  
12 independent Claim 1, the rejection of Claim 34 over Foo in view of Fayad should be withdrawn,  
13 since the claim is patentable over these references. Similarly, since dependent claims inherently  
14 include what is recited in the independent claim on which they depend, Claims 35-40 are patentable  
15 over Foo in view of Fayad for at least the same reasons as set forth above in connection with  
16 Claim 34.

17 Patentability of Claim 41

18 Independent Claim 41 is directed toward a method for black-blood angiography that enables  
19 visualization of blood vessels and lesions formed inside the blood vessels of a patient. As amended  
20 applicants’ step (c) recites “next, waiting a predefined inversion time calculated as a function of a  
21 number of slices to be imaged at the site within a predefined repetition time, said predefined  
22 inversion time being determined so that a sequence of RF pulses and magnetic field gradient pulses  
23 are applied to read out the signal for imaging a successive selected single slice at each successive  
24 time when a magnetization signal for the flowing blood is substantially zero, wherein the signal for  
25 imaging each successive selected slice is acquired while the magnetization of the flowing blood is  
26 substantially zero for said slice.” Thus, for the reasons noted above in conjunction with applicants’  
27 traversal of the rejection of Claim 1, the rejection of Claim 41 over Foo in view of Fayad, and further  
28 in view of Kholmovski should be withdrawn, since the claim is patentable over the teaching of Foo –  
29 even in combination of the other two references, neither of which corrects the deficiency of Foo  
30 discussed above. Similarly, since dependent claims inherently include what is recited in the

independent claim on which they depend, Claims 42-44 are patentable over Foo and the other references for at least the same reasons as set forth above in connection with the traversal of the rejection of Claim 41.

Patentability of Dependent Claims

The Examiner has rejected Claims 5, 6, 16, and 17 under 35 U.S.C. §103(a) as being unpatentable over Foo. However, these claims ultimately depend from independent Claims 1 and 10 respectively. Since dependent claims inherently include what is recited in the independent claim on which they depend, Claims 5, 6, 16, and 17 are patentable over Foo for at least the same reasons as set forth above in connection with the traversal of the rejection of Claims 1 and 10.

The Examiner has rejected Claims 8, 13, and 33 under 35 U.S.C. §103(a) as being unpatentable over Foo in view of Fayad. However, these claims ultimately depend from independent Claims 1, 10, and 29 respectively. Since dependent claims inherently include what is recited in the independent claim on which they depend, Claims 8, 13, and 33 are patentable over Foo in view of Fayad for at least the same reasons as set forth above in connection with applicants' traversal of the rejection of Claims 1, 10, and 29.

In view of the Remarks set forth above, it will be apparent that the claims in this application define a novel and non-obvious invention. The application is in condition for allowance and should be passed to issue without further delay. Should any further questions remain, the Examiner is invited to telephone applicants' attorney at the number listed below.

Respectfully submitted,

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